PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Masakazu NISHIKAWA, et al.

Docket No: Q66604

Appln. No.: 09/994,891

Group Art Unit: 2651

Confirmation No.: 8056

Examiner: Varsha A. KAPADIA

Filed: November 28, 2001

For: MAGNETIC TRANSFERRING METHOD, AND METHOD AND APPARATUS FOR CLEANING MAGNETIC TRANSFER MASTER MEDIUM

DECLARATION UNDER 37 C.F.R. § 1.132

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Masakazu NISHIKAWA, hereby declare and state:

THAT I am a citizen of Japan;

THAT I have received a doctorate degree in Engineering in 1996 from The University of Tsukuba;

THAT I have been employed by Fuji Photo Film Co., Ltd. since 1996, where I hold a position as staff researcher;

THAT I am a named co-inventor of the above-identified U.S. Application Serial No. 09/994,891;

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THAT in order to demonstrate the superiority achieved by the claimed range set forth in claim 2, the following experiments were carried out under my supervision and control:

Embodiment 1: A patterned Ni substrate was produced using a stamper method. The pattern comprises radial lines extending from positions 20mm to 40mm from the center of the substrate. The pit length is 0.15μm, the track width is 1.0μm, the track pitch is 1.1μm, and the groove depth is 0. lμm.

A soft magnetic layer (FeCo 25at%) was formed on the patterned Ni substrate at a substrate temperature of 25°C. An Ar sputtering pressure was 0.18Pa (1.08mTorr). The applied wattage was 2.80W/cm^2.

A planar recording slave medium was produced in a vacuum film forming apparatus (S-50S sputtering apparatus by Shibaura Mechatronica). After depressurization to 1.33 x 10^{-5}Pa (1.0 x 10^{-7}Torr), argon was introduced. Then, pressure was set at 0.4Pa (8.0 Torr), and a glass plate was heated to 200°C. A 3.5 inch discoid magnetic recording medium was produced with CrTi30nm, CoCrPt3Onm, saturation magnetization of 5.7T (4500Gauss), and a coercive magnetic force of 199kA/m (2500Oe).

Perfluoromethylene oxide was coated on the surface of the master carrier at an amount of 2mg/m^2 by a spin coating method. Thereafter, the master carrier and the slave medium were placed in close contact at a close contact pressure of 0.05MPa, and signal recording was performed.

Evaluation was performed using an electromagnetic conversion characteristic measuring apparatus (SS-60 by Kyodo Electronics) having an MR head with a reproduction head gap of

0.15μm; a reproduction track width of 2.0μm; a recording head gap of 0.18μm; and a recording track width of 2.4μm. The slave medium was set in the SS-60 and a rotation speed was set so that the linear speed was 10m/sec at a radial position 40mm away from the center thereof.

Reproduction output was observed for the entire surface within the range of 20mm~40mm in the radial direction from the center of the slave medium. The average value of reproduction output was set as TAVG. A digital process was administered which assigned a signal value of "zero" to spots at which the reproduction output was less than TAVG, and assigned a value of "one" to spots at which the reproduction output was greater than TAV4.

The area of the spots at which the output was assigned a value of "zero" by the digital process ("zero signal area") was divided by the evaluated disk area (radius 20mm~40mm, angular range 0~860°). Slave media in which the value of zero signal area/evaluated disk area was 0.1 or less were evaluated as "OK", and those in which the value of zero signal area/evaluated disk area exceeded 0.1 were evaluated as "No Good".

Embodiment 2: The same magnetic transfer method as Example 1, except that the amount of liquid coating was changed to 15mg/m^2.

Comparative Example 1: The same magnetic transfer method as Embodiment 1, except that the amount of liquid coating was changed to 22mg/m^2.

Comparative Example 2: The same magnetic transfer method as Embodiment 1, except that no liquid coating was administered.

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	Amount of Liquid Coating (mg/m^2)	Zero signal area/ Evaluated disk area	Evaluation
Embodiment 1	2	0.09	OK
Embodiment 2	15	0.002	OK
Comparative Example 1	22	0.2	No Good
Comparative Example 2	0	0.3	No Good

As shown in the table above, in the case that the amount of liquid coating is too small, the close contact force imparted thereby is weak, and a sufficient close contact state cannot be realized. On the other hand, in the case that the amount of liquid coating is too large, the liquid itself causes the spacing between the master carrier and the slave medium to become large, resulting in signal recording deficiencies.

I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: October 31, 2003

Masakazu Nishikawa